

Five Lectures on Textual Gait

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Abstract This article presents five text analyses produced with Perspective Text Analysis (PTA / Vertex), founded on the Action-action-Objective paradigm, which Immanuel Kant once proposed in theory and which today is operational. After a terminological discussion about style in writing, the term proposed is *textual gait*. Thereafter five lectures are presented with the following contents: The first lecture, which introduces the application of the method PTA / Vertex, addresses the problem of formulating a hypothesis to match a model that the researcher intended to study. The second lecture takes us back to the Renaissance and investigates to what extent a politically oriented life-wisdom conveys the same inner pattern when transmitted from Italian to English by two persons in modern times. The third lecture moves us forward in time and examines a few lines from an Enlightenment poem with a philosophical and theological theme and its transfer from the original French to German. The fourth lecture studies a policy-oriented English text, pointing to the ethical problem that accompanies the time of the scientific revolution. The fifth lecture explores the energy that a modern scientific American theory has in the master's wording and the energy it receives when reformulated by a disciple. Each lecture thus has its own theme.

The Problematic Concept of Style

There is hardly any concept within the humanities that is so difficult to grasp as style. It may refer to different expression patterns of texts and to an author's way of expressing her / his intentions, but also to extra-textual factors, such as the reader's experience, which becomes problematic (Cassirer, 1970). Linguistic stylistics aims to say something about a text of a certain type. It is primarily on the basis of linguistic categories that investigations take place to mark significant features that distinguish a certain text from another within the same norm (Enkvist, 1973). Consequently, language-based criteria are the foundation for a-priori assumptions about texts. Based on frequent occurrence, conclusions about genres are drawn. The problem with the norm thinking is that the norm will control the result, as in the content analysis, namely that the analysis rests on extra-linguistic criteria.

A common way of speaking about style in a linguistic context is to assume that the expression we talk about may have more than one variant, regardless of whether the level is sound, word, grammatical form, set-up or composition of paragraph (text). The language statistical branch, sometimes referred to as stylometry (for example, Kenny, 1982) suggests that a text can be attributed to a particular author on the basis of the distribution of lexical and grammatical features (Ellegård, 1982; Johannesson, 1973). The starting point is to find such linguistic features that differ significantly from the norm, which consists of already known texts by the author to which the attribution applies. In addition to the difficulty in treating style as a statistical issue, objectivity in the selection of criteria can be questioned. Since expressions may have different meanings at different grammatical and textual levels, it is difficult to argue that different expressions would be variants of the same thing.

When the author of a text is known, especially in fiction, the criteria are based on two kinds of norms, namely comparisons between other texts of the same author and deviations

and similarities in relation to other writers' ways of writing. To identify discrepancies as difference in style, they must be subtle and be there together with "normal" basic similarities in general (Beardsley, 1958). It goes without saying that frequency-based statistics is not relevant in these cases. Rather, the result of the text analysis is the registration of the features that are uniquely different, features that protrude and surprise and are relevant to the perception of the text. A literary text operates through its quality and not by the amount of peculiarities.

When the criteria for assessment are conditioned by extra-textual factors, including the reader's experience and perception, we get into fields that are difficult to operationalize. The reason is that the effect of reading depends on criteria that must be perceived as unknown. The analysis is nothing else but intuitive, or, as in the traditional content analysis terms, it is impressionistic. In such a model, statistical procedures are avoided, but at the same time it means that the reliability of the analysis is low. In order to counteract the intuitive features, the researcher develops his own definition and establishes criteria that apply in a particular case, which does not prevent the method from changing due to new needs (Gray, 1969). Because the internal features of the text are unknown and subject to arbitrary approaches by a reader / researcher who himself creates the effect of his reading, the ability to define what is meant by style is lost. The relationship between form, content and effect is hardly a satisfactory definition of style, rather of rhetoric. It should be unsatisfactory for style research to include the reader or other kinds of human functions in the definition.

It can be concluded that classical methods offered for style studies rely only on the presence of superficially observable features. One disadvantage is the dependence on large amounts of text. However, the scientific main problem lies in the normative, which implies that the categories are applied on a material from the outside.

Style as Movement

Style is a quality that the viewer perceives as something invariant. This kind of quality controls the recognition of a human being in the dark or at a long distance, when external signals are eliminated. Instead, it is the way of moving in a unique way that defines people, that is to say, the interaction between inherited experience of an environment and the body's guidance system (Bernstein, 1967). The system has also been studied by Kugler and Turvey (1987), where they established the concept of self-assembly for the movements and forces that create rhythm, for example when an organism moves forward. The movement pattern of a person has in recent times also characterized her in a longer life cycle. So, since a person's text is a product of herself, the linguistic movements in the text are signs of her individual-specific expressions (I. Bierschenk, 1992).

The present article will contribute with a new definition of style, one which is empirical, operational and bio-kinematically anchored. Instead of basing the style concept on description and semantics, we need to see it as a structural concept, as something inner. This kind of style needs a name that better associates to the way of moving. The English word 'gait', as well as the German 'Gang', 'Gangart', tells what it is about. The words include both 'pace' and 'time', that is to say, moving forward (stepping) at a certain rate and rhythm. It also has much of the French word 'démarche' (measure). The concept 'writing style' has been used in studies of young people's ways of expressing how they approach a task and formulate their understanding in certain learning situations (B. Bierschenk, 2005; I. Bierschenk, 2005). However, in 'writing style' it is not clear that structure is what emerges out of the writing movements. A bit closer lies the concept of temperament (I. Bierschenk, 2012), but there the progressive movement in the text building behaviour itself is missing. Therefore, the term chosen is 'textual gait'.

A Method for Describing Textual Gait

One way to analyse the gait in a text is to provide a thermodynamic view of how a text is generated. Gait manifests itself through the writer's way of expressing an inner dynamic as it is provided by the person's experience of movement in an environment. It follows that the methodological repertoire needs to be linked to current developments in the areas of complex systems, nonlinear dynamics, self-organization, and self-reference. The study of how a writer has incorporated his surroundings must be done with a method that can reproduce the textual movement, which is both physical and mental. This method is called Perspective Text Analysis (PTA / Vertex) and represents a text from the interior. The method relates to string theory and the mathematics developed for calculating distances in a space that moves forward and rotates, as well as it has major connections to the discovery of topological phase transitions (B. Bierschenk, 1993 / 2013, 2011). It thus includes both a language theory and a text theory (I. Bierschenk, 1989, 1999 / 2003, 2011a). The different stages of development of the method have been presented at national and international conferences and in courses and workshops (e.g. I. Bierschenk & B. Bierschenk, 2004).

The smallest units in this analysis are the graphemes. The analysis creates a protocol of how strings of graphemes are manifested and interwoven in the text building, a process that is concealed when a person speaks or writes. This protocol uncovers the mechanism showing the gaps in the flow that creates disparities and determines with what the gaps should be filled for the weave to be complete. The mode of action of this instrument involves a visualization of the invisible. Graphemes and sequences of graphemes help to create the image of the invisible but it has no meaning until the picture is clear. Thus, the text is the whole, and therefore it is its own autonomous frame of reference.

A text flows in a time-bound rotating movement and rhythmically. This is the natural way in which language creates the elasticity necessary for communication. The more elasticity or implicitness, the more space will be created. Two components operate in this space creation movement, namely the Agent [A], which has its position before the verb in the clause, and the Objective [O], which has its position after the verb. These positions are fixed and independent of semantics. Thus, an Agent does not correlate with a person. The two components rotate with and against each other during the entire process, and not until the movement ends, the components have performed their task to create the contours of a text space (image), that is, the full textual extension. When this shall be summarized graphically, it is based on the distance between the values, which form a wave. Thereafter, the flow dynamics in the dimensions [A] and [O] may be studied separately, without their mutual dependency being shattered. Another word for flow dynamics is textual gait.

Selection of texts

Most researchers who use natural texts to investigate what they call structure seem to imagine that the significance of the text increases with increased length. But normatively based theories of selection and testing have hardly any significance for what conclusions can be drawn about how texts vary in natural situations. Decades of empirical studies and development of PTA have shown that the researcher should instead select a place in the text that is significant for the scientific problem in question.

Such a selection was made by two PhD students in connection with a research course in business administration at Lund University. This text (consisting of 50 words in two sentences) from a longer interview with an administrative director of a municipality was the basis for an entire course. The doctoral students who made the selection had not got a clear

idea of what the paragraph was about, but were led by their intuition. Participants have testified to how they gradually gained insight into the intentions and orientations of the interviewee without having to spend time sorting the speech noise in the information of the entire interview. The fact that the results of the PTA analysis were perceived as significant depends primarily on the sensitivity of the two PhD students to the text they chose. Applications of PTA with this prerequisite in various disciplines and research areas are reported (I. Bierschenk, 2011b).

The text used in the above-mentioned course is the same that illustrates the different steps of the method in the manual (I. Bierschenk & B. Bierschenk, 2011). The text is translated into several languages (see List of Manuals after References) and can be used for different types of comparisons. One can estimate that the affinity between Germanic languages gives a similar movement texture and that the Romanic languages form a group of their own. However, the Potential Energy Surface (PES) graphs show that it is not quite as simple. Although the translators have made the effort to stay as close to the original as possible, there are some discrepancies, which of course are language-specific but also relate to the translator himself. The personal use of the linguistic link system becomes a hallmark that distinguishes the parts of the system that are available to the translator.

Experiments of the kind described have shown that a short linguistic wording on a substance essential for the text producer is far superior to a longer and less rhetorically qualified text when the goal is to reach a core. Concise formulations exist in all areas, from literary aphorisms to scientific hypotheses. However, just because the text is short and seemingly without superficial noise, it is not certain that it is unambiguous.

The first lesson, which introduces the application of the method PTA / Vertex, addresses the problem of formulating a hypothesis to match a model of what the researcher intended to study. The second lesson takes us back to the Renaissance and investigates to what extent a politically oriented life-wisdom conveys the same inner pattern when it is transmitted from Italian to English by two people in modern times. The third lesson takes us forward and examines the passage in a few lines from an enlightenment poem with a philosophical and theological theme and its transfer from the original French to German. The fourth lesson studies a policy-oriented English text that points to the ethical problem that accompanies the time of the scientific revolution, called the Naturalism. The fifth lesson explores the energy that a modern scientific American behaviour theory has in the master's wording and the energy it gets when reformulated by a disciple. Each lesson thus has its own theme.

Lecture 1: The Climate Hypothesis

In order to avoid the above-mentioned selection problem, natural scientists have invented the so-called Causal Loop Diagram (CLD). By creating a link between modelling and theory, their assumption is that such models circumvent the ambiguity prevailing in traditional *word-models* (Jeffers, 1978, p. 14).

A doctoral student whose dissertation was about ecological conditions in Iceland was asked to design a CLD, which would depict the relationship between temperature and land use. The diagram (B. Bierschenk, 2003, p. 11) shows with the direction of the arrows how the relationships in the links should be interpreted. The dominant arrow goes west-east and the non-dominant in the east-west direction. Because the information in the links was thought to be difficult to depict in an unambiguous manner, the student was asked to describe in words how the diagram should be read. The result was the statement given in Figure 1:1.

The translation of the diagram to words is now expected to be so concise and simple in its formulation that it will match the meaning of the symbols and reflect the dynamics of the

model. We will now study how this expectation has been met by applying PTA / Vertex to the short wording. First, the text is encoded and then the values are transferred to a graphing program representing the text through a PES (Wales, 2003).

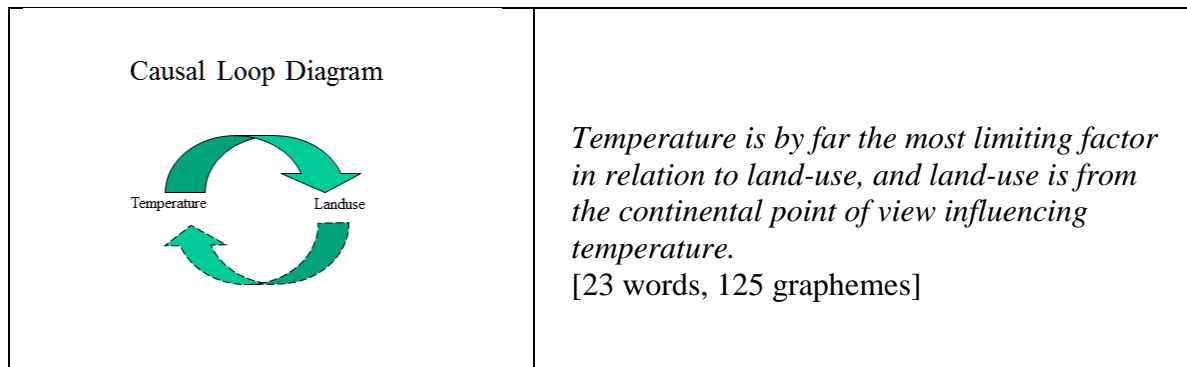


Figure 1:1 CLD of a geo-physical climate hypothesis

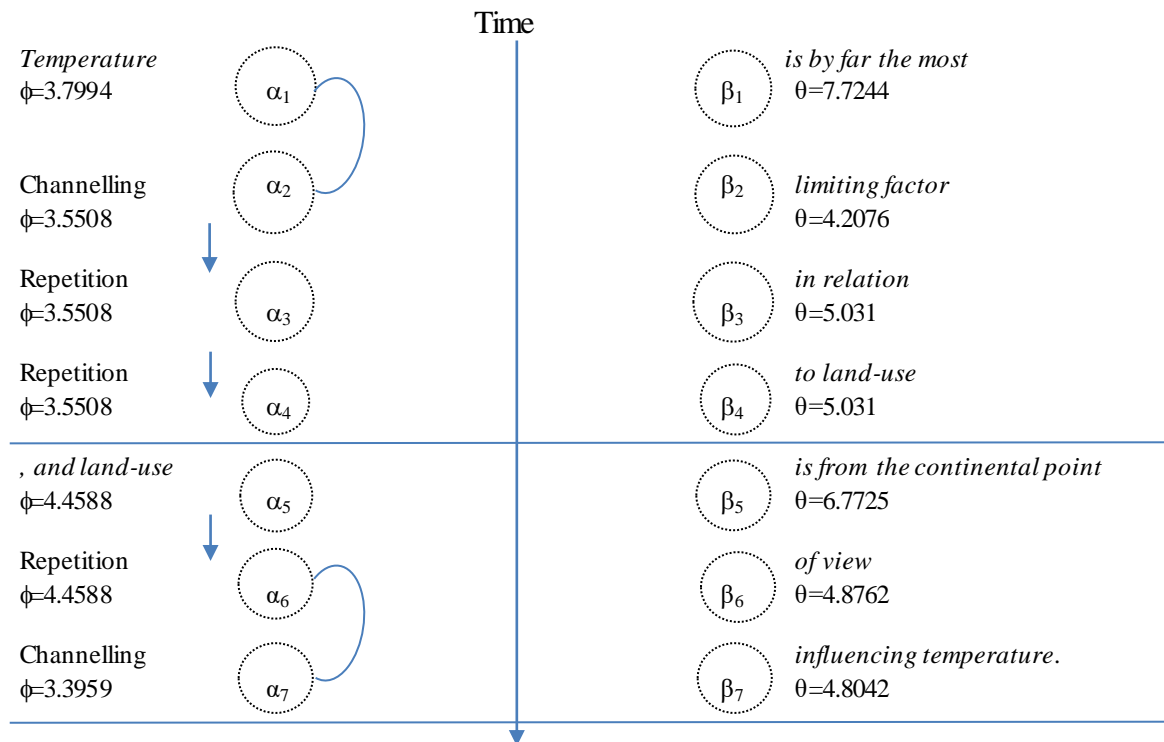


Figure 1:2 Coding protocol of the climate hypothesis

The Time arrow marks forward movement and separates the Agent and Objective fields, while the horizontal line marks interval border. The Agent is characterised by channelling and repetition. Channelling, marked by curved lines, means that a dummy is substituted with the root of the immediately preceding α -variable. Repetition, marked by vertical arrows, denotes the dependency of what happens on the Objective side, that is, the breaking of a string sequence (marked by pointer (preposition), such as *in*, *to*, *from*, *of*). This breaking causes changes in angle, which means that the Objective is viewed from a motionless point of observation from the Agent's side and thus differentiates the perspective. Repetition of a grapheme configuration leaves the winding factor unchanged. In contrast, channelling

specifies the degree to which a particular grapheme configuration is reversibly addressed during the course of writing and thus is changing the winding factor. As Figure 1:2 shows, (α_1) is changed at (α_2), which means that the (α_\emptyset) is supplemented with the *shadow* i.e., the (ROT (α_1)) of the textual agent of the immediately preceding functional clause. The same principle has operated at (α_5) / (α_6) when it is fading into position (α_7). Variation in shadowed and materialized strings makes up the most visible differences in textual gait.

If we now return to the hypothesis formulation and consider how the surface can be observed, then we see that the two intervals are asymmetric from a few aspects. The number of graphemes per interval differs slightly (the first interval has 59, the other has 65). Likewise, the two intervals are differently balanced, because the number of verbs per interval differs (the first interval has one verb, the other has two), which contributes to the difference in rotation. How this difference has influenced the PES graph of the climate hypothesis is illustrated in Figure 1:3. The graphs have been produced with SigmaPlot (2014, Version 13.0).

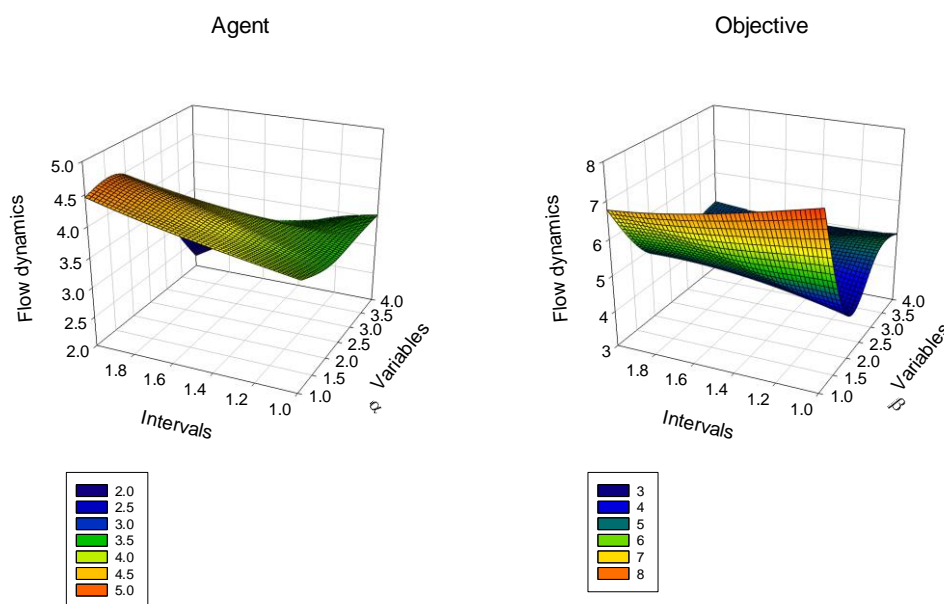


Figure 1:3 *Textual gait in the temperature and land-use hypothesis*

As we can see, the A's and the O's have produced a type of gait that consists of shapes that are forming complementary moves; they are partly running with a similar speed, partly in altered fashion. These wave functions indicate a perspectivation in the Agent component that is different from the perspectivation in the Objective component, although subtle. Thus, this gait is progressing anti-symmetrically since it lacks the mirror relation of symmetry. So, there is no support for an asymmetric expression of the links, as can be expected from the materialized language of the formulation. It can therefore be concluded that PTA / Vertex has revealed the true sense of the CLD.

Lecture 2: Aphoristic Renaissance Prose

The current and the following lectures shall not only give examples of the dynamics of short and condensed texts but also make some flash-backs to historic time. The example just discussed is modern, belonging to the late 2000s, while we are now going to pick up a writer from the Renaissance, which has not ceased to fascinate both researchers and debaters of

society. A cut from a letter, written by the author and politician Niccolò Machiavelli, is now to be placed under the magnifier.

The text has been discussed from a structural point of view, which includes the writer's intention and orientation (B. Bierschenk, 2012) but here the presentation will stop at the flow dynamics. Below you find the Italian original text (Letter to Francesco Guicciardini, 17 May 1521), after which the graphs of its flow dynamics are displayed.

*Perché io credo che questo sarebbe il vero modo ad andare in paradiso:
imparare la via dello inferno per fuggirla.* [20 words, 95 graphemes]

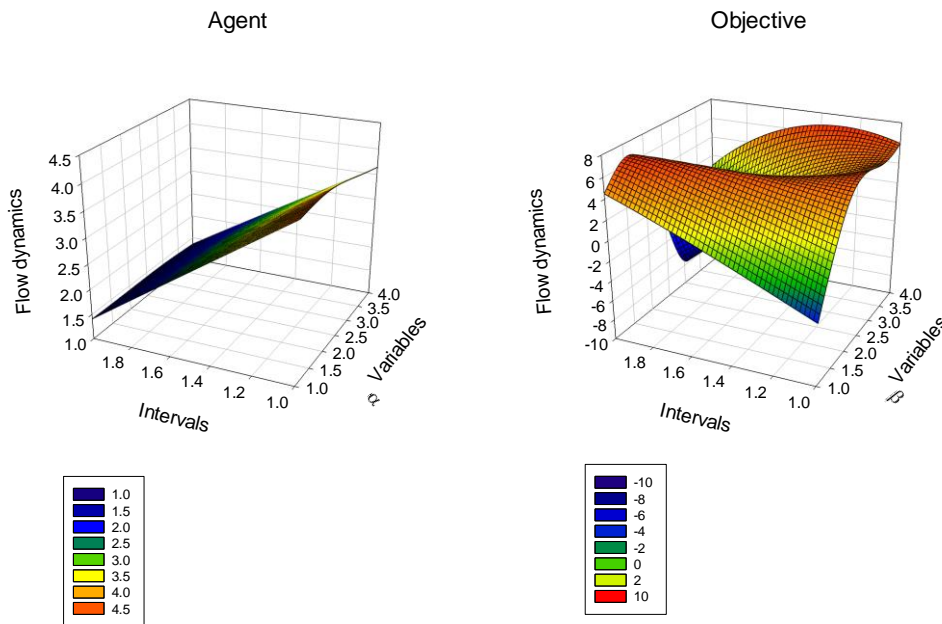


Figure 2.1 *Textual gait in Machiavellian prose*

Comment: Data have been loaded from left to right, as in ordinary reading, and as a consequence, the graphs have to be read from the right, that is, the textual gait starts in the lower right corner with the intersection variable *I* and interval 1. Further, intervals are determined only by punctuation marks. The text has two intervals, which is the minimum requirement for space representation.

The agent variable (α_1), which is *Perché io*, is opening up the flow and is a materialized variable, while (α_2), the materialized *che questo*, is channelled to (α_3) as last shadowed variable in the first interval, and to (α_4) as first shadowed variable in the second interval. The variables (α_5) and (α_6) are repeated values, while the last, (α_7), is a new channelled value because of the dummy following the pointer *per*. This pattern is reflected in the Agent graph as a linear thin flake that is sinking in speed.

The Objective is presenting itself as extremely dynamic in comparison. Its movement starts with (β_1) under the surface, depending on the dummy variable after the verb *credo*. It then goes on in a relatively high speed, since (β_2), *sarebbe il vero modo* and (β_3), *andare in paradiso*, are accumulating the rotation values. In the second interval, (β_4), *imparare la via*, and (β_5), *dello inferno*, continue in almost the same speed as the preceding variable ending the first interval. The pointer *per* is followed by a dummy, which is the shadowed (α_7), and the verb *fuggirla*, whose Objective has to be marked as covered. These two circumstances are

causing the implicitness shown as the deep surge at the end of the second interval. The flowing gait of the Machiavellian text can thus be summarized as highly asymmetric in shape. It shares this property with other naturally produced texts. Contributing here is a steadfast Agent position, which is steering a harmoniously evolving Objective shape.

Exploring two translations

Since the Italian expression is conveying something eternal in real life and in literature, it has been translated by various writers. This lesson will recapitulate two of these translations. The first one is taken from Atkinson & Sices (1996). The second is taken from Patapan (2006).

*I think the nearest way to (\emptyset_A) reach Paradise (\emptyset_A) should (\emptyset_O) * (\emptyset_A) be (\emptyset_O), to (\emptyset_A) get (\emptyset_O) to (\emptyset_A) know the way to Hell with the purpose to (\emptyset_A) avoid it.*
[25 words, 90 graphemes] (Atkinson & Sices)

*I believe (\emptyset_O) that the following would (\emptyset_O) * (\emptyset_A) be the true way to (\emptyset_A) go to Paradise: (\emptyset_A) learn the way to Hell in order to (\emptyset_A) steer clear of it.*
[26 words, 97 graphemes] (Patapan)

These two examples have been chosen because they differ in their flow dynamics, although on the verbal surface they seem to be conveying the same meaning with slight variability. The comparison will begin with surface features, which require some comments.

An asterisk is marking the whirl that is an effect of two verbs following each other, a circumstance that expands the texture. Further, supplementation symbols for A- and O-dummies have been inserted to mark where shadowing (channelling and repetition) is taking place. The variables (A-O pairs) are nine in both examples while the number of places for A-dummy differs; the first example has six, while the second has four. However, O-dummies are related equally in both cases. When it comes to the number of verbs generating the functional clauses, they are seven in the first text and six in the second, a slight variation that ought not to be decisive for the outcome. Yet it is. Compare the following phrases: *I think the nearest way...* and *I believe that the following* The latter is constructed as a subordination, which generates an edge to a deep Objective, whose winding value is (≈ -4.80). In the former, the clause marker has been omitted, which makes *the nearest way* a manifest Objective ($\approx +4.96$). The two shapes should therefore be distinctly different at the start of the topological layout. To support further clarifications, the graphical representations will now be displayed. Figure 2:2 shows the translated text of Atkinson & Sices and Figure 2:3 show the text of Patapan.

It is important to be aware of the functioning of the PES. Depending on the highest and lowest rotation values, the program computes the potential (latent) spatial extension. As is shown in the graphs, the first translation represents about ten times as much space dynamics in the Objective component as the second translation. It is due to the intricate twisting movements, where the roots shall be filled from the bottom upwards. The motivation for this is that meaning can only be determined when the text processing has been completed. This movement comprises combined rotations of implicit and explicit A and O variables in a pendulum fashion. An efficient demonstration is the way Atkinson and Sices have performed their translation task. Now, let us explore their spatial texture.

As was supposed, the first objective starts with an upward movement, but then it dives into a valley, caused by the rotations in *should* (≈ -53.82) ... *be* (≈ -47.19) ... *get* (≈ -32.50)... . Here we see the effect of the function of filling upwards in the processing. The flowing movement is thereafter levelled out and ends with increasing values: *know the way* ($\approx +4.4$), *to Hell* ($\approx +4.8$) *with the purpose* ($\approx +6.8$), and finally descends to *avoid it*. ($\approx +4.3$). Increase in

rotation value has to do with the base values of pointers (prepositions). Behind this measure is the distinction that the rotation is faster with increasing distance from the verb. Related to the underlying linguistic model, each pointer marks a differentiation in the Objective, where the Agent takes a fixed position (and becomes repeated). What can be seen in the graph is a significant underwater wave to begin with, which is inertly moving but is accelerating.

As regards the Agent component, there is only one materialized agent variable, namely the first string I ($\approx +3.49$). All others are shadowed and are descending to (≈ -7.90). But at the two pointer cases, the agent variable is repeated, since the agent of *to know* (≈ -5.42) is also the agent of *to Hell* and *with the purpose*. The effect on the shape is a sloping plane with uneven movements on the surface.

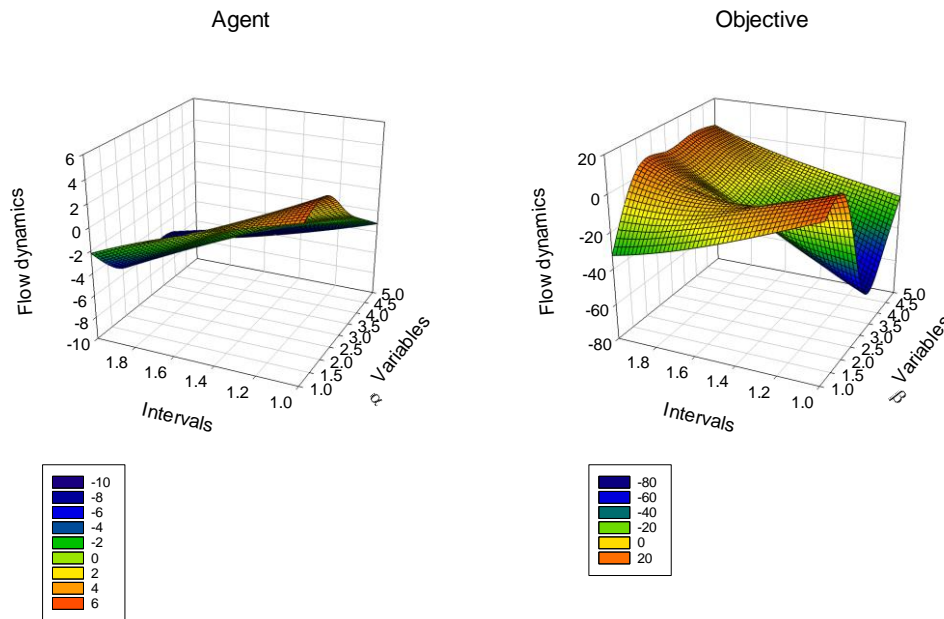


Figure 2:2 English translation gait from Atkinson & Sices (1996)

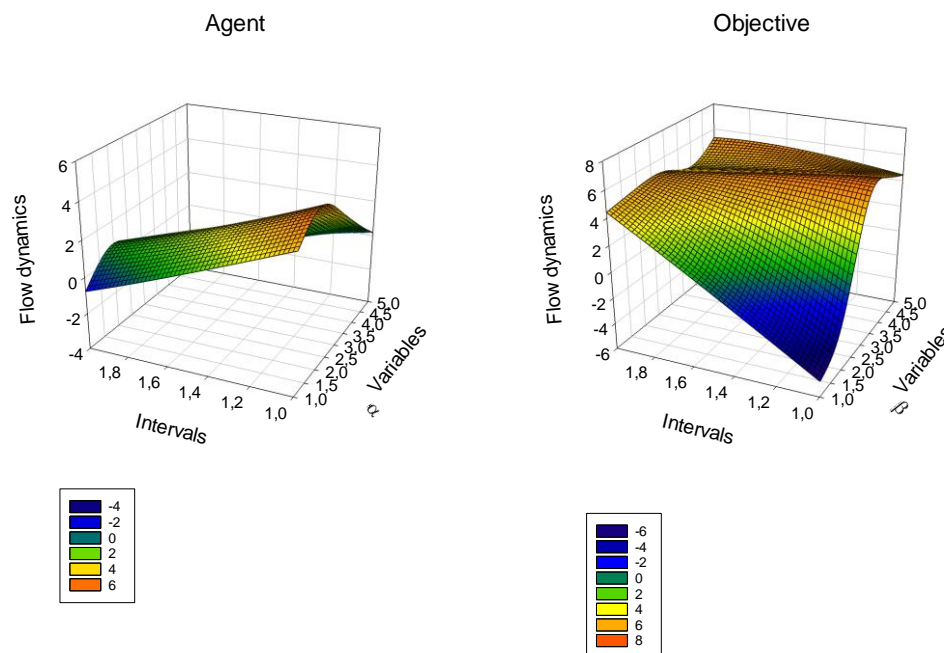


Figure 2:3 English translation gait from Patapan (2006)

The assumption about the initial depth in the Objective of Patapan's translation could be confirmed. It shows a less dynamic shape than the former and there are several reasons for that: the number of verbs, fewer dummy places and fewer differentiating pointers. The pointers *to*, *in*, and *of* take the same base value, which implies that an accelerating speed towards the end is not as evident (*to Paradise* ($\approx +5.50$), *to Hell* ($\approx +4.88$), *in order* ($\approx +4.91$), *of it*. ($\approx +5.30$)). Clearly this smooth waving movement is reflected in the back side of the graph.

Like the former text, the Agent component starts with *I* ($\approx +3.49$) but in addition a second agent variable has been materialized, which is *the following* ($\approx +4.58$). The shading starts with the agent of *to go* ($\approx +1.39$), then descends via the agent of *learn* (≈ -1.07), which is repeated because of the differentiation on the Objective side, and ends with a channelling at *to steer* (≈ -3.45). Compared to the former Agent, this one is slightly broader in its manifestation, which thus can be observed in the extension of the shape.

Summary

The Agent expresses observable differences compared to the original, although it gets the same basic form. The Objective of the original is characterized by a curvilinear spiral form, which has not been fully reproduced in any of the translations. A comprised analysis of the gait in Atkinson and Sice's text is that it takes several smaller steps forward than the original does, giving a lively impression on the Objective shape. The gait in Patapan's text is somewhat slower and instead gives a restrained impression. The mirror technique (Greene, 1999), which shows the interaction between Agent and Objective, reveals that the previous text has a greater degree of anti-symmetry than the latter. It must be interpreted so that the natural coordinates of language have operated in a more efficient way. Since any thorough interpretation is not crucial for the transfer to English here, the language becomes more important than the message, and thus the previous text succeeds best to correspond to the original. It is interesting to note that the latter more closely follows the manifest features, such as the wording of the introduction, the translation of *questo* and colon followed by infinite verbal form, in an attempt to adapt the text to the potential of the source text. However, the result does not come closer at the structural level.

Lecture 3: Philosophic Rhyme of the Enlightenment

This lecture will be devoted to a piece of poetry by the Enlightenment philosopher François de Voltaire, who deals with the earthquake in Lisbon in 1755, which he regarded as an overwhelming event in the intellectual history of humanity. Voltaire fought the Catholic Church and its dogmas, which meant denying any kind of life after this, that is to say, that we should not expect either punishment or reward. When the Lisbon disaster had just occurred, he wrote the famous poem, whose last two lines summarized his standpoint. Voltaire's friends and critics thought, however, that 'adorer' was not enough optimistic, so before he could publish the poem, he changed 'en silence' to 'espérer' (hope). This was not satisfactory, so he ended up adding twenty-two lines where, according to the general view of the world, he acknowledged God's generosity (Durant & Durant, 1965, p. 382). It was a reluctant apology. Since it can be assumed that the first version was the one who engaged Voltaire the most, especially the last two lines, these are the ones to be used here:

*Que faut-il, ô mortels? Mortels, il faut souffrir,
Se soumettre en silence, adorer, et mourir.*
[15 words, 80 graphemes]

Durant's collection on cultural history (Durant & Durant, 1965, p. 382) provides a translation for the German public. However, the German language does not have the same iambic emphasis on the last words of the verse, so it does not rhyme and has a different rhythm. Therefore, from our topological point of view, it may be interesting to see how the French text looks when it is translated into German. The text reads:

*Was tun, o Sterbliche? Sterbliche, wir müssen leiden,
uns in Stille unterwerfen, anbeten und sterben.*
[15 words, 85 graphemes]

This lecture will now discuss the two texts in parallel. Table 3:1 shows at which points the two texts correspond to each other. Where they differ occurs in the second line where (1) German word sequence must move the verb to final position and (2) German does not put comma in front of 'und'. In the last case, Durand could have made a deviation if he had emphasized similarity and thought of a break here, but choses to follow the grammar rules.

Table 3:1

Parallel poem: French versus German

Que	Was
faut-il	tun
,	,
ô	o
Mortels	Sterbliche
?	?
Mortels	Sterbliche
,	,
il	wir
faut	müssen
souffrir	leiden
,	,
Se	uns
soumettre	in
en	Stille
silence	unterwerfen
,	,
adorer	anbeten
,	,
et	und
mourir	sterben
.	.

Will this difference now appear in the topological representation, and if so, how? The French original is shown in Figure 3:1 and the German translation in Figure 3:2.

An interval is defined by the presence of a verb within punctuation marks, in the PTA system called clause markers and sentence markers respectively. The Table above indicates that the French original has five intervals while the German translation has four, which corresponds to seven pairs of variables against six. Moreover, the two Figures show that here,

as in the previous text, the Agent is smaller than the Objective. The graphs also reflect the natural topological complementarity between Agent and Objective. However, the expected asymmetry is much clearer in the translation than in the original, which may be due to a greater variation in the movement pattern.

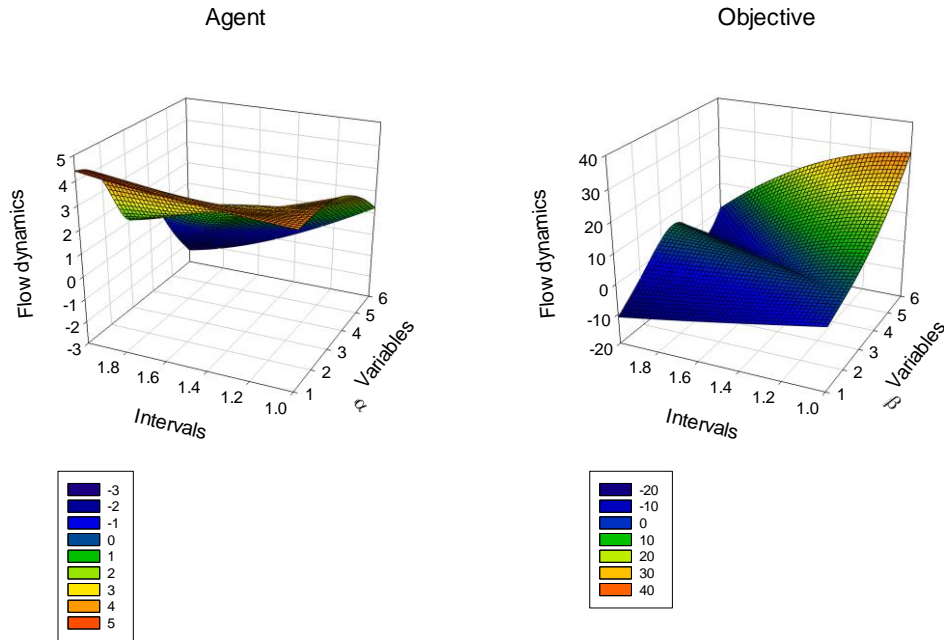


Figure 3:1 *Poem of Voltaire: French gait*

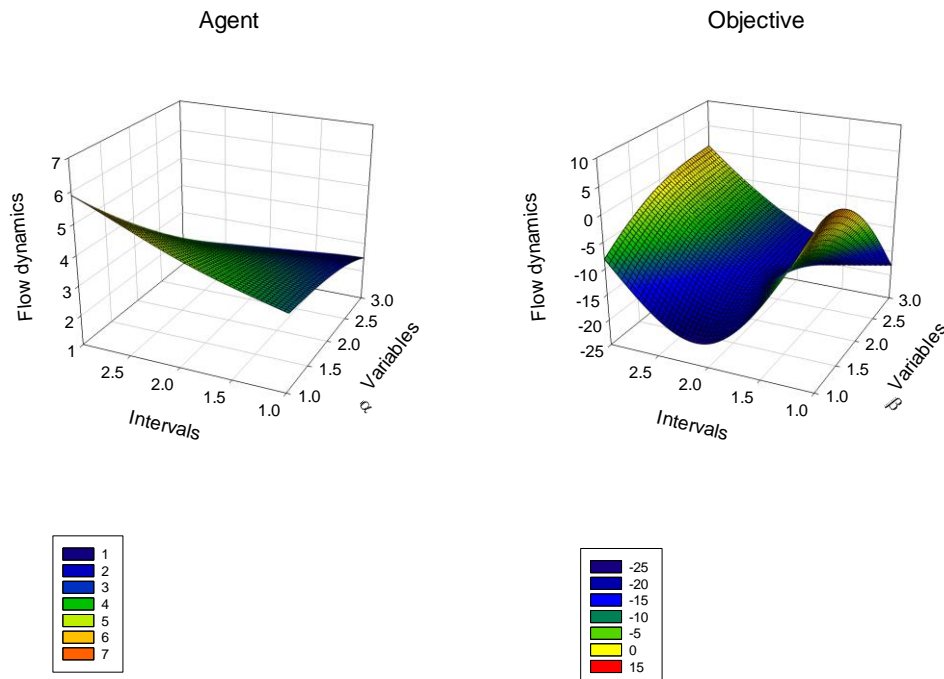


Figure 3:2 *Poem of Voltaire: German gait*

The interval at which the highest point occurs is in both cases the third: in the French original, *soumettre en silence* (≈ 5.73) forms the sharp upward movement to the right in the Objective, while the Agent in the German text reaches its peak through *uns in Stille* (≈ 5.88). The value of the French expression sums up the verb plus the differentiation with pointers, while the German expression separates the verb and instead calculates the pointer as integrated before the verb, which is done with other base values. Although the superficial difference is very small for the rest, it is clear that the potential energy of the two texts differs significantly. Both create depths through the repetition of verbs. The deepest place of the French occurs in the Objective of the second interval after *faut* (≈ -6.84), while the corresponding place in German, *müssen* (≈ -20.32), shows the consequence of the location of the verb *unterwerfen*. Where the French in the third interval after the verb has a materialized variable that blocks to pick up roots, the German has a dummy variable that opens for an immaterial value. Thus, what happens next is shadowing, which is deepened by the accumulation of roots.

Attention

Language students at different levels, as well as connoisseurs of European languages in general, often express the opinion that the French language is beautiful and romantic and that German is rigid and systematic (same as boring). It is highly probable that this conception comes from experiences with the hearing, which is also the sense that is working when texts are read. The rhythm affects the feeling of the text. No matter what characteristics that trigger that feeling, when the meaning of the said is not in focus, it is a matter of superficial moves. This comparison shows an apparent difference in favour of the German text, if it is judged that the aesthetic aspect in a language has to do with oscillation.

Lecture 4: Policy statement from the Time of Naturalism

Charles Darwin is one of the researchers whose name is forever associated with the birth of modern science. Nature would no longer be regarded as the image of God, a thought, for example, in Jean-Jaques Rousseau's literary views, and in Carl von Linnaeus's descriptions of Nature, inspired by the belief that animals and plants were established through the hand of a creator. In the 19th century's naturalistic flora of ideas, all living evolves evolutionary, which sets the individual person / explorer in independent and responsible relief to the phenomenon she / he observes and commentates. Courbet in the history of art and Flaubert and Zola in the history of literature honoured the truth regardless of how disgusting it was. To many advocates of "the Modern", the art of photographing was the main instrument by which the external reality could be depicted. But it meant that the belief in what the eye saw was not disrupted by *trompe-l'oeil* effects. In today's media world, such effects are called false facts and fake news or, with White House's coinage, alternative facts. Our negative reactions to this trend are probably based on a belief in the scientific approach as a norm for news dissemination. When the institutions of a society depart from the norm, it requires that we, the public, have considerable knowledge to assess the reasonableness of the matter. If we have not, we will develop false conceptions.

Darwin expressed himself in a refreshing way about false facts versus incorrect conceptions in *The Descent of Man and Selection in Relationship to Sex* (1871, p. 385). This text, which is known as a policy statement on the conditions of science, is the study material of this lesson. The text reads:

False facts are highly injurious to the progress of science, for they often endure long; but false views, if supported by some evidence, do little harm, for everyone takes a salutary pleasure in proving their falseness; and when this is done, one path towards error is closed and the road to truth is often at the same time opened. / Charles Darwin on false facts vs. false views: The Descent of Man and Selection in Relation to Sex (1871, p. 385). From the series Great Ideas of Western Man. / [59 words, 273 graphemes]

We have again to do with a piece of prose like the one from the Renaissance. This is about three times longer at both word and grapheme level. The text is reasoning toward a statement of opinion and contains, as can be assumed, personal experience of the research community's way of acting on its task with both respect and seriousness. It is expected that this colourful way of expressing a message will lead to more dynamic topology than the narrower, more proverbial-like language of the Renaissance example. Figure 4:1 illustrates the dynamics.

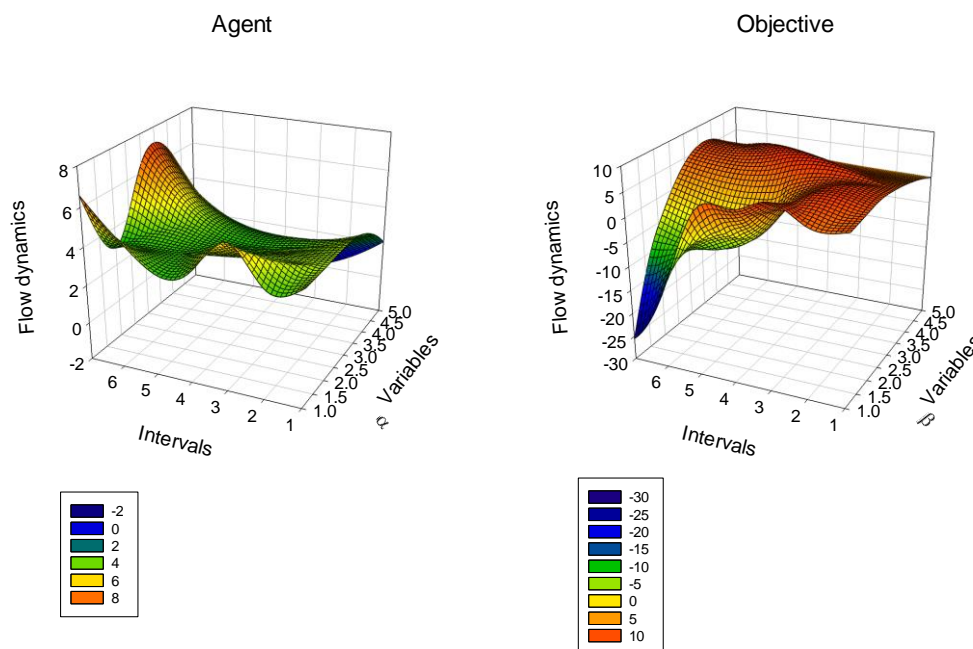


Figure 4:1 *Textual gait in Darwinian prose*

Naturally produced text is asymmetrical. This text satisfies the criterion to a great extent. For the interpretation of the movement pattern in the graphs, the protocol is offered in Figure 4: 2. The text has seven intervals filled with a large number of manifest variables, whose strings consist of several complex sequences. A long sequence that distinguishes the Objective intervals one, three, four, and five, and the Agent's interval three and seven, implies high speed in the forward move. The movement stops during repetition and channelling (symbolized by (...)). Shaded variables, which appear in minus values on the Objective side, mean that the movement is slow and weighed down to a point below the surface. By following the protocol, we can see to what extent Agent and Objective are coordinated.

The first interval shows that the Agent is quite slow while the Objective moves at a higher speed. In the second interval, they follow each other by both slowing down, and then accelerating in the third interval before the speed drops again in the fourth. In the fifth interval, the Agent takes it easy while the Objective varies considerably; here comes the first

negative value. The sixth interval implies a slight increase in the raising of speed in the Agent and at the same time a slight slowdown in the Objective. The most dynamic interval is the seventh of both sides. The Agent accelerates from the first to the second variable in the interval, then goes down, gets up again to finally stay quite low. The dynamics of the Objective is largely the reverse. At variable pair ($\alpha\beta$ 11), the components are highly diverse, and here is the lowest point of the Objective and the highest of the Agent. At variable pair ($\alpha\beta$ 12), the speed decreases in the Agent but rises in the Objective. To some extent, however, the speed between the two towards the end is equalized.

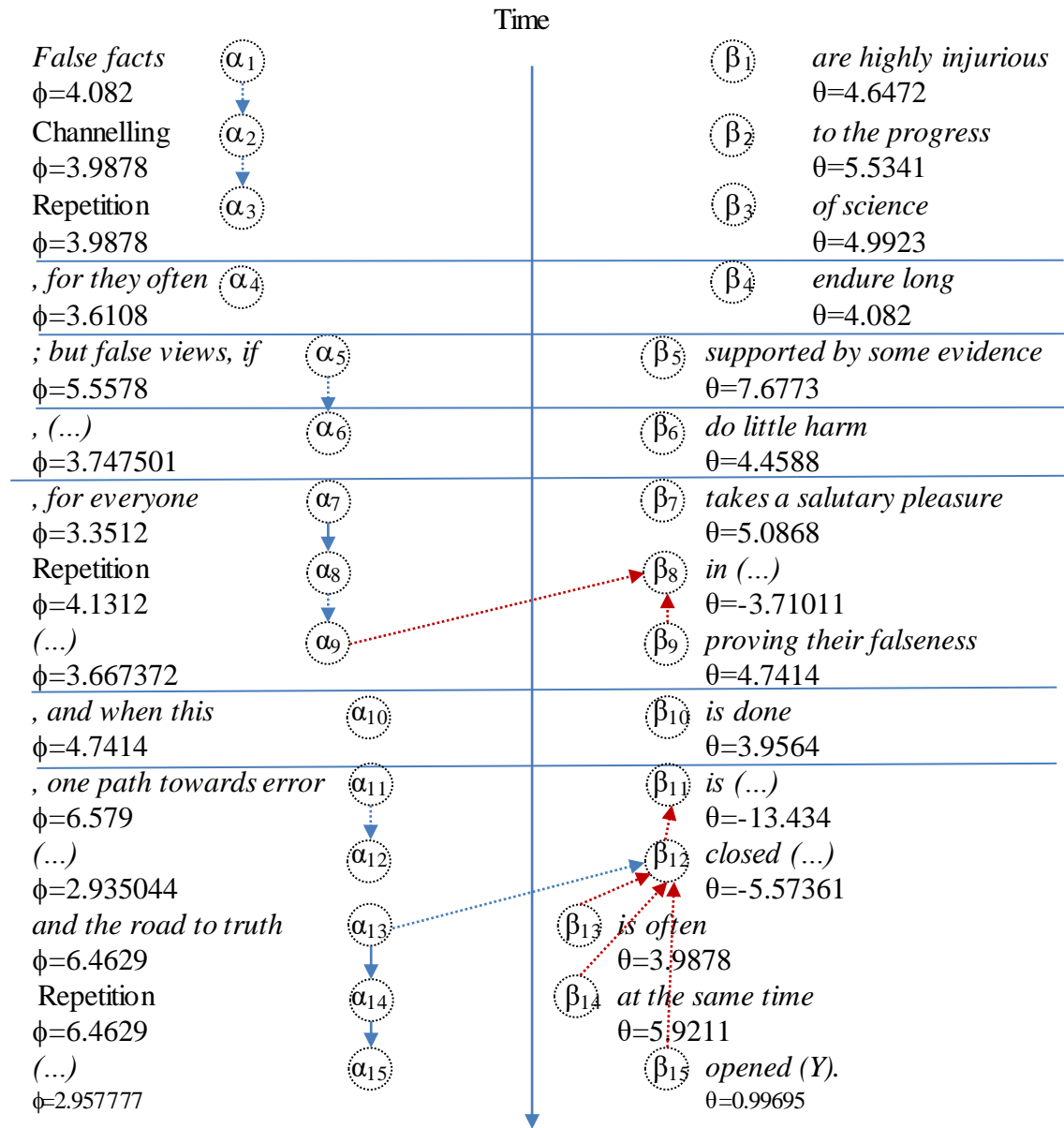


Figure 4:2 Coding protocol of naturalistic policy statement

Some further comments to the protocol may be appropriate. Pointers on the Objective side cause repetition on the Agent side. The Agent is thus the same when the Objective consists of differentiations. The pointers take different basic values depending on the type. Type 1 is represented here by *to*, *of*, *in*, *at* and type 2 by *by*, while type 3 (e.g., *for*) does not occur. The

cases of *for* found in the second and fifth interval of the Agent are calculated as integrated with a function other than pointers. (About the pointer function, see I. Bierschenk, 1999 / 2003, 2011a. The base values (messengers) are reported in B. Bierschenk, 2011.)

The red arrows symbolize how intricate the nesting becomes through the double verbs and the empty position after *closed*. This immaterial variable retrieves the three following variable pairs, where also the material variable (α_{13}) is included (blue arrow from α_{13}). The rotations that eventually form (β_{11}) can be called the root of the text (-13.434), which is clearly reproduced in Figure 4:1. For the interested reader, the calculation is given here. The base value for agent dummy is (5.5). The value of the verb *is* is (0.7536) + the base value of the objective dummy after the verb, which is (6.28), i.e. (7.0336):

$$=7.0336-(\text{ROT}(5.5)+\text{ROT}(6.579)+\text{ROT}(7.2848)+\text{ROT}(6.4629)+\text{ROT}(3.9878) \\ +\text{ROT}(5.9211)+\text{ROT}(5.5)+\text{ROT}(6.4629)+\text{ROT}(0.99695))$$

The Agent – the producer

As the dynamics of the graphs reflect, the Agent is remarkably movable, which indicates that the author of the text is deeply involved. Objective and Agent control each other in an interactive fashion. Surely most people conceive of the natural science approach to reality this way. The root of false facts dips between ‘is’ and ‘closed’. It could hardly be articulated more naturalistically precise.

Lecture 5: Theoretical Program of Behaviourism

Much has happened in science from Darwin to modern times. As early as the beginning of the last century the science of man developed, not her origin but her behaviour and how it says something about her prospects and potentials for change, completely regardless of the laws of evolution. One of the pioneers of the so-called behaviourism was John B. Watson. During the early decades of the 20th century he developed ideas and an experimental methodology in trying to understand behaviour by measuring only what could be observed. Well-known is his theoretical explanation (Watson, 1930, p. 92):

Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select – doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors.

[61 words, 316 graphemes]

Figure 5:1 illustrates a text space characterized by high potential energy and a striking, rolling movement dynamics. The two components are highly asymmetrical; where the movement leads downward in one of them, it rises in the other. The text has three intervals and fifteen variable pairs. The graphs show how the program converts data to a scale, so the number of variables does not match the specified scale.

The initial verb at the very start means that an unknown agent is controlling the flow, which has the value (0) and thus is immobile. By repeating itself, the Objective receives two variables that move from the initial state. Already here we see how the two components behave differently. Some deep wave movements in the Objective occur in the transition between the second and third intervals, at the sequence *bring them up in* \emptyset_O (≈ -11.93), because the pointer controls the process of opening toward a number of roots: *and I will* \emptyset_O (≈ -6.78) * \emptyset_A *guarantee* \emptyset_O (≈ -5.05) *to take* As previously mentioned, values of agent

variables are also integrated into these minus values. Diagonally to this movement, the Agent produces a corresponding decreasing movement at $\text{and } \emptyset_A (\approx -0.67)$ train him to $\emptyset_A (\approx -3.22)$ become The two components meet in a twist at $I \emptyset_A (\approx -6.36)$ might $\emptyset_O (\approx -16.89) * \emptyset_A (\approx -8.71)$ select ..., where the Objective swirls upward after having reached its deepest point, while the Agent stands still in its deepest location. They do not meet either at the end.

Sometimes language is talked about as ornate, even flowery, of which this text may be an example. As a scientific statement, it is perhaps too much literary in kind. But it should be remembered that this style was desirable, as long as a so-called journalese for research prose had not been invented.

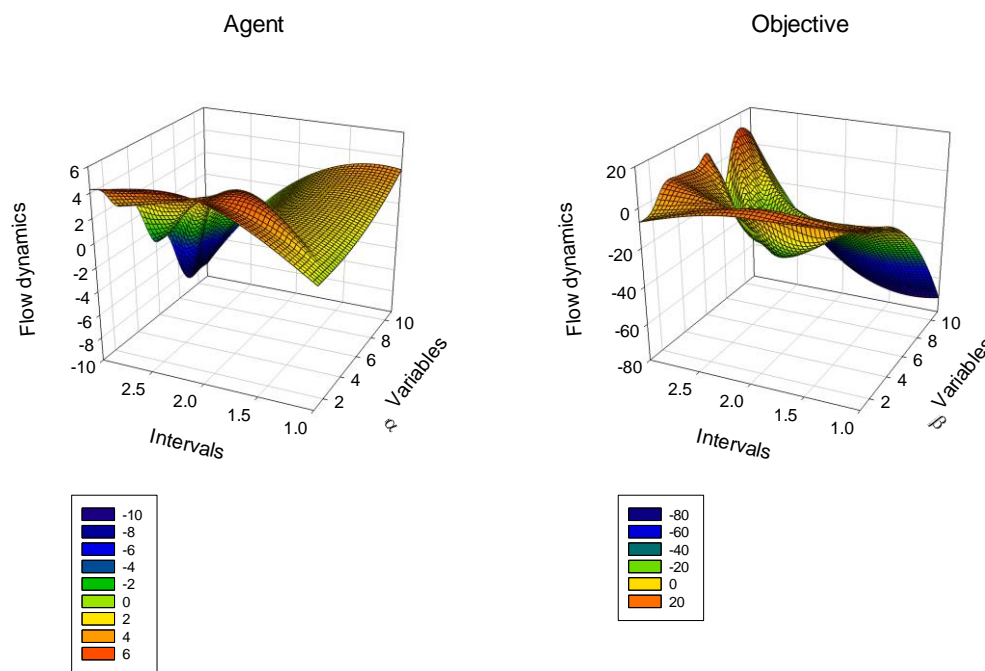


Figure 5:1 *Textual gate: Watson's behaviourism*

No behavioural theory has had greater impact than behaviourism. One of Watson's most productive disciples is B.F. Skinner, who also wrote novels, where he discusses the pros and cons of a society based on the laws of behaviourism. Many of his ideas have been the foundation in, for example, programmed teaching and other areas of application where it is important to change by reinforcing positive behaviour. A quote from Skinner, featured on multiple quotation sites, is a compressed version of Watson's behaviourism:

Give me a child and I'll shape him into anything

Skinner's theory of reshaping people, children or adults, so that they become adapted to their environments has been called social engineering. It is testified that the Nordic countries, especially Sweden, have embraced this theory in political practice. Studies using American materials have shown that Swedish students understand the behaviourist model of society best when comparing it with the humanist and the cybernetic models. Likewise, they understand fiction best when it is based on behaviourism (I. Bierschenk, 1997, 1998).

Language Engineering

In order to focus on the art of engineering in linguistic practice, it may be illustrative to produce a text in Skinner's spirit, which is a bit longer than the quotation above (it must have at least two intervals), so that it is possible to apply PTA / Vertex to it. We will therefore imagine that Skinner formulates Watson's text in a way that it fits into a more technical way of thinking.

It is likely that Skinner wanted to get the text sharper. The first thing he reflects on is how the first clause should be worded up to the comma. He changes the word sequence but keeps both descriptions. The observable *well-formed* is more important to him than the more intuitive *healthy* and puts it first. He generalizes the study object and makes *infants* a broader concept, which can refer to children of higher age, i.e. *children*. The special world is an unnecessary specification for him, because he believes that the reshaping can be done anywhere. He drops that phrase.

Then he removes the double verb form because it gives an angle that he does not think is straight enough. He simply guarantees and expresses this with a *that*-clause where the agent is *I* instead of being implicit. Likewise he thinks the phrase *at random* is an unnecessary angle and replaces it by *randomly*. In addition, he concretizes the situation so that *each one* refers to the individual study object (each of the twelve) instead of *any one*, because now it is not general anymore, now he is in operational mode. He also does not forget to be neutral in the gender issue and replaces *him* with *it*. The word *type* can be omitted without further notice. As for the selection of what the object may become, Skinner believes that the phrase *I might select* introduces a personal experimenter perspective, which hardly belongs to the exemplification, so it is replaced with *you like*, which is neutral and does not include any assessment.

When it comes to the examples of occupations, he cuts the designation *chief*, as it is more a designation of degree than the profession as such. What he wants to add as an outermost limit (with *yes, even*) is not *beggar man*, since he does not think that begging is a condition that should be positively reinforced. Instead, he strengthens *thief* to become *master*, perhaps an indication of the spirit of time. Now he introduces the black box- thinking and enhances it by changing *regardless of* into *totally irrespective of*, because it emphasizes to a higher extent that context and upbringing should not at all be respected.

Finally, examples are given of the characteristics that will not be respected. The listing begins with *his* in Watson's example. Skinner becomes consistent with what he writes earlier and uses *the child's*. Here he again becomes clearly more general than the original. *Ability, interests, race, or ancestry* is what remains when he scrutinizes the master's more avid way of expressing himself. *Talents* is included in *abilities*, *penchants* is too vague and can be interpreted as too intimate and *tendencies* adds nothing further. He removes *vocations* because it is not a trait like the others, since he wants to purify. Instead, he adds *interests* that is wider and saves on the number of words. The phrase *race of his ancestors* formally takes too much space, and *race* is decoupled to apply the observational object itself in the first place. At the same time, *ancestors* is depersonalized by the variant *ancestry*, which also includes social descent.

The hypothetical text written by Skinner reads as follows:

Give me a dozen well-formed, healthy children, and I guarantee that I can take each one randomly and train it to become just any specialist you like, doctor, lawyer, artist, yes even master thief, totally irrespective of the child's ability, interests, race, or ancestry.

[44 words, 228 graphemes]

The text now comprises 72% of the original number of words and 72% of the number of graphemes, a veritable engineering work. The result gives the dynamics shown in Figure 5:2.

The straight textual gait is markedly reflected in the shapes. The reasoning about avoiding space and unnecessary angles in several places has given the desired effect. Both components have shrunk their potential energy. All this reduced language transforms the literary, asymmetric dynamics into a highly symmetrical product.

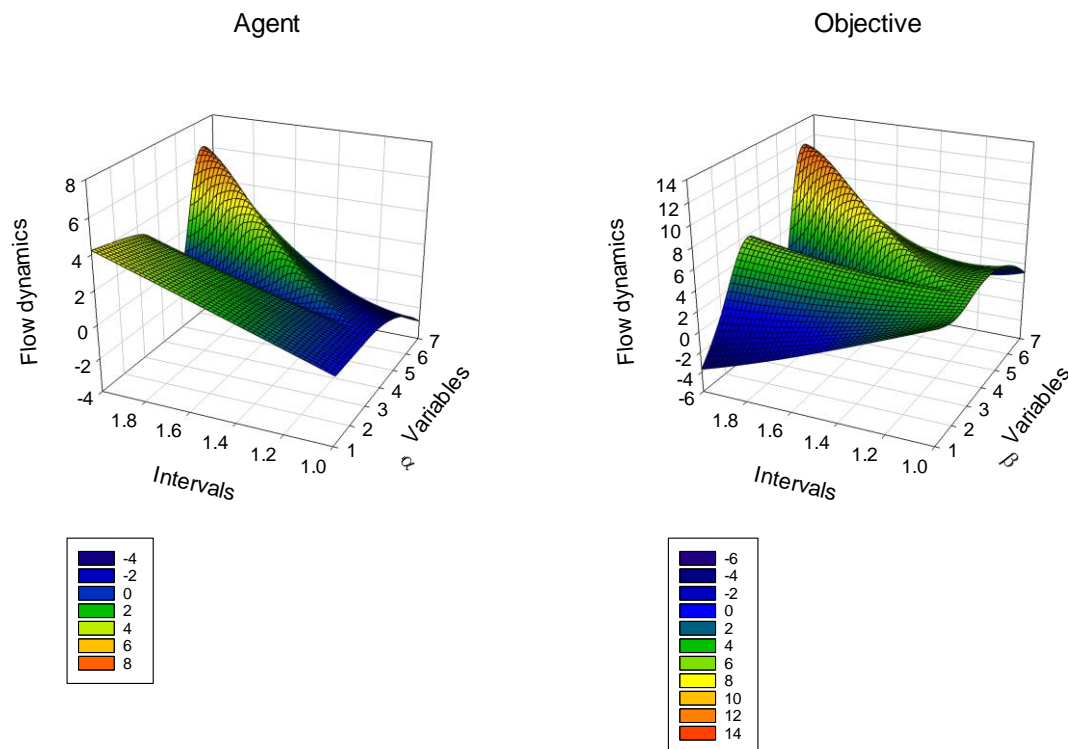


Figure 5:2 Textual gait: Skinner's engineering

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